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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/429,530	10/28/1999	YOSHIHIKO FUKUMOTO	35.C12395CIP	6048

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NEW YORK, NY 10112

EXAMINER

VINH, LAN

ART UNIT	PAPER NUMBER
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1765

DATE MAILED: 12/04/2003

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Please find below and/or attached an Office communication concerning this application or proceeding.

0025

Office Action Summary

Application No.

09/429,530

Applicant(s)

FUKUMOTO, YOSHIHIKO

Examiner

Lan Vinh

Art Unit

1765

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 31 October 2002.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 55-66 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 66 is/are allowed.
- 6) ☒ Claim(s) 55-65 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. §§ 119 and 120

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☒ Certified copies of the priority documents have been received in Application No. 09/429530.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 13) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.
a) ☐ The translation of the foreign language provisional application has been received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s). _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449) Paper No(s) <u>22, 23</u> | 6) <input type="checkbox"/> Other: |

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 55-65 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sasaki et al (US 5,607,718) in view of Maekawa et al (US 5,868,866)

Sasaki discloses a polishing method comprises the steps of:

forming an insulating film 62 on a substrate 61, forming an interconnection/switching element in the substrate (col 19, lines 1-3)

etching to remove portions of the insulating layer 62 to form concaved down section/trench in the layer 62 (col 19, lines 3-5), the trench/concaved sections forms a wiring pattern and contact holes in an interconnection formation (fig. 19)

forming a metal film of Al on the insulating film and in the trench/concaved section with the insulating film removed (col 9, lines 54-56; fig. 12A), which reads on forming a film of an electroconductive metal material on the insulating film

polishing the metal film to remove the metal formed on the insulating layer and to expose the upper surface of the insulating layer (col 9, lines 55-57; fig. 12B)

washing the upper surface of the substrate including the Al metal surface/reflective face and the insulating surface by a first cleaning of ultrasonic cleaning and then a scrubbing using PVA (col 19, lines 55-57)

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Unlike the instant claimed invention as per claims 55, 65, Sasaki does not specifically disclose using an ultrasonic wave at a frequency band of not less than 800 KHz.

However, Maekawa discloses a method for cleaning wafer after polishing comprises the step of washing the upper surface of the substrate by a first cleaning of ultrasonic cleaning using a nozzle and ultrasonic wave at a frequency band of 1.0 MHz-1.5 MHz/not less than 800 KHz (col 6, lines 40-45)

Since both Sasaki and Maekawa are concerned with a method of washing wafer after a polishing step, one skilled in the art would have found it obvious to modify Sasaki's ultrasonic cleaning step by using an ultrasonic wave at a frequency band of not less than 800 KHz as per Maekawa because according to Maekawa as a result of using an ultrasonic cleaning step by using an ultrasonic wave at a frequency band of not less than 800 KHz, the particles/residues are vibrated separated from the upper surface of the semiconductor wafer and washed away by the ultra pure water (col 6, lines 29-35)

Regarding claim 56, Sasaki discloses polishing the wafer using a slurry and a polishing pad (col 19, lines 20-25)

The limitations of claims 58-60 have been discussed above

Regarding claim 61, Sasaki discloses using an ultrasonic washing after the scrubbing (col 11, lines 50-53)

Regarding claim 62, Sasaki discloses forming a laminated film of etching stopper film 64 and insulating film 62 in the trench/concaved section as seen in fig. 19

Regarding claim 63, fig. 20B of Sasaki shows the surface of film 62 under layer 64 is polished flat

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Regarding claim 64, Sasaki discloses forming a multi-layered wiring as shown in fig.

43C

Allowable Subject Matter

3. Claim 66 is allowed.

The following is an examiner's statement of reasons for allowance:

Regarding claim 66, the cited prior art of record fails to disclose a method for fabricating a semiconductor device comprises the step of forming a second insulating film which covers the metal material formed in the concave section with the first insulating film being removed. The closest prior art of Sasaki et al (US 5,607,718) discloses the step of forming a second insulating film 70 which covers the metal material formed in the concave section with the first insulating film 62 not being removed (fig. 28)

Response to Arguments

4. Applicant's arguments with respect to claims 55-65 have been considered but are moot in view of the new ground(s) of rejection.
5. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

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A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

Conclusion

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Lan Vinh whose telephone number is 703 305-6302.

The examiner can normally be reached on M-F 8:30-5:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nadine Norton can be reached on 703 305-2667. The fax phone number for the organization where this application or proceeding is assigned is 703 872-9310.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703 308-0661.

LV
Dec 2, 2003

SUPERVISOR
NADINE G. NORTON
PRIMARY EXAMINER

